FINAL PERFORMANCE REPORT

South Carolina State Wildlife Grant F15AC00730

South Carolina Department of Natural Resources

October 1, 2015 - September 30, 2017

Project Title: Building partnerships on state, federal and private lands to promote conservation of seabirds and shorebirds

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Objective:

Build partnerships to help manage and protect seabirds and shorebirds in coastal SC. Increase the protection of nesting and migratory shorebirds and seabirds by reducing human disturbance at key sites.

Activity 1. Identify and recruit partners that have important seabird and shorebird habitat and would be willing to learn to become stewards of these species on their properties. Identify a site coordinator at each location.

Accomplishments:

18 sites were targeted for partnering with land managers in protecting beach nesting birds (Table 1). Partners (N = 93), excluding SCDNR coastal bird staff, were involved in on-the-ground site management. At most sites, partners were staff or volunteers from the site's management organization. Although site managers took a greater active role in conservation this year, a site coordinator was not always identified.

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Table 1. Sites where seabird and shorebird nest protection was a partnership between land owner or manager and SCDNR coastal bird staff. Total number of people reported participating in nest protection efforts excluded SCDNR coastal bird staff.

SITE	MANAGEMENT	SPECIES TARGETED FOR NEST PROTECTION	# PARTNERS: AFFILIATION	
North Island	SCDNR	AMOY, WIPL	5: 1 DNR; 1 Hobcaw Barony; 3 sea turtle volunteers	
Bosun's Point	Hobcaw Barony	LETE, AMOY, WIPL	5: 1 DNR; 1 Hobcaw Barony; 3 sea turtle volunteers	
South Island - north end	SCDNR	LETE, AMOY, WIPL	3: 1 DNR; 2 sea turtle interns working for Yawkey	
South Island - south end	SCDNR	LETE, AMOY, WIPL	1: 1 volunteer (College of Charleston)	
North Santee Bar	SCDNR	BLSK, LETE, ROYT, SAND, AMOY, WIPL	1: 3 DNR	
Cedar Island	SCDNR	WIPL	2: 2 DNR	
North End of South Cape Island	USFWS	AMOY, WIPL	7: 1 DNR; 2 USFWS; 4 volunteers	
South End of South Cape Island	USFWS	AMOY, WIPL	7: 1 DNR; 2 USFWS; 4 volunteers	
South Lighthouse Island	USFWS	LETE, AMOY, WIPL	10: 2 DNR; 2 USFWS; 6 volunteers	
White Banks Island	USFWS	BLSK, LETE, GBTE, AMOY, WIPL	4: 1 DNR; 2 USFWS; 1 volunteer	
Marsh Island	USFWS	BRPE, ROYT, SAND, AMOY	4: 1 DNR; 2 USFWS; 1 volunteer	
Bird Key, Bulls Bay	USFWS	LETE, AMOY, WIPL	2: 1 DNR; 1 USFWS	
Botany Bay Island	Private/TNC	LETE, AMOY, WIPL	9: 3 DNR; 2 TNC; 4 volunteers	
Botany Bay Plantation	SCDNR	LETE, AMOY, WIPL	10: 2 DNR; 8 volunteers	
Edingsville	Private	LETE, AMOY, WIPL	5: 1 DNR; 4 volunteers	
Seabrook Island	Private	LETE, AMOY, WIPL	7: 1 DNR; 6 volunteers	
Edisto Beach State Park	SCPRT	LETE, AMOY, WIPL	3: 1 DNR; 1 SCPRT; 1 volunteer	
Folly Beach County Park	CCPRC	LETE, AMOY, WIPL	7: 1 DNR; 1 CCPRC; 5 volunteers	

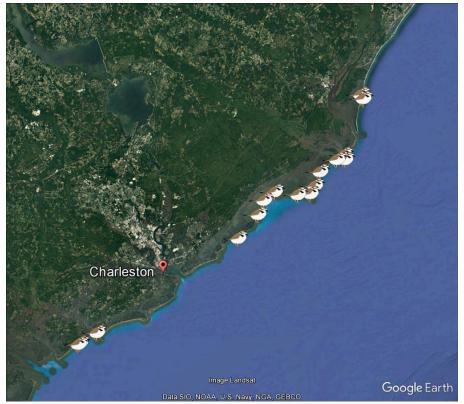


Figure 1. 18 beach sites (marked with plover icon) in South Carolina where partnership building increased shorebird and seabird nest protection.

Cape Romain National Wildlife Refuge partnership activities

During this grant we strengthened the partnership with Cape Romain National Wildlife Refuge (CRNWR) staff in protecting seabird and shorebird nesting areas. This included partnering with staff to close nesting areas, monitor nesting activities, and to implement changes in sea turtle management activities (which may have detrimental effects on seabird and shorebird nesting). Because CRNWR has some of the largest concentrations of seabirds and shorebirds in South Carolina, we focused more efforts in building partnerships with CRNWR staff than in other areas of the coast.

In February 2016 and 2017, shell islands known as the White Banks and Marsh Island, and a 25 acre island located in Bulls Bay, were posted as closed to any landing until September. Both of these areas are significant seabird and shorebird nesting sites. White Banks supports the highest density nesting of American oystercatchers in South Carolina, and Marsh Island has nesting brown pelicans, royal terns, and sandwich terns (Figure 2). We assisted CRNWR staff in designing appropriate signs to indicate beach closures and coordinated with them to place signs.



Figure 2. Marsh Island and White Banks located in Cape Romain National Wildlife Refuge. These islands have high concentrations of seabird and shorebird nesting, and SCDNR and USFWS staff partnered in placing closed signs at these sites to protect nesting and migratory birds.

In April areas on islands in the northern part of the CRNWR were identified as potential seabird colony nesting sites. CRNWR staff and volunteers placed signs around nesting areas, closing the sites to human disturbance. Signs were placed at 4 sites on 3 islands (Figure 3).



Figure 3. Nesting areas on islands in the northern part of Cape Romain National Wildlife Refuge where signs were placed to limit human disturbance; the Lighthouse Island site included string between posts due to the high number of summer visitors. ATV use was restricted at the ends of the islands (marked in blue) because of high density bird nesting.

CRNWR staff were included in meetings to develop Best Management Practices for Use of Vehicles on Sea Turtle Nesting Beaches. In 2016 and 2017, CRNWR staff and volunteers avoided driving around the ends of islands where seabird and shorebirds were nesting. This

change was a significant step toward lessening the negative impact of sea turtle management on seabird and shorebird nesting and a goal achieved because of partnership building.

Seabird nest monitoring on Cape and Lighthouse Islands was primarily done by CRNWR staff in 2017.

Pier Romeo partnership activities

Pier Romeo is a 600 ft. long concrete pier located next to the NOAA Office for Coastal Management at the old Charleston Navy Base (Figure 4). The pier is no longer used for docking ships. It is owned by NOAA. NOAA and other stakeholders adjacent to the property—including the Coast Guard, the Federal Law Enforcement Training Center, and the State Department—agreed to support Pier Romeo as a possible least tern nest site in 2016.



Figure 4. Pier Romeo at the old Charleston Navy Base, South Carolina. Nesting area for least terns is outlined in blue, and the placement of the electric fence is in yellow.

In late April, pea gravel was spread in a 30 ft. by 120 ft. area at the end of the pier. All openings that could be hazardous for mobile chicks were covered with hardware cloth. Wooden pallets were placed to provide shade. To attract least terns, a Murremaid Sound System was employed to play the calls of a least tern colony, and least tern decoys were set up in the gravel. At the entrance to the pier a 2.5 ft. high solar powered electric fence was placed to deter mammals. All of this work was accomplished with 30 volunteers from NOAA and USFWS Ecological Services under the supervision of the SCDNR Coastal Birds Project staff. Since the setup of the pier occurred late in the nesting season, it was not expected that any least terns would come to the area. However, in late June a pair arrived and laid a 2 egg nest, and this was followed by 4 more pairs (Figures 6 and 7).

NOAA staff monitored the terns daily. A short film clip including video taken of the adults and chicks at the site was made and sent to other NOAA offices. This video gave least terns national

attention! At any one time at least 9 chicks were observed, and by mid-August at least 7 fledged young were observed.

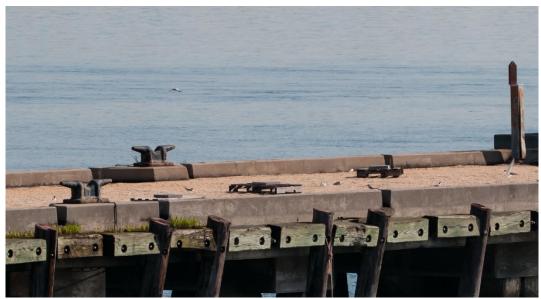


Figure 6. Pier Romeo with least terns in the gravel area.



Figure 7. The first least tern nest to hatch on Pier Romeo.

In the Winter of 2016/2017, SCDNR participated in a Pier Romeo Project assessment meeting with NOAA and USFWS partners. The first season of least tern nesting on the Pier Romeo site was summarized and plans for the 2017 season were made. Presently, NOAA is in support of continuing the project and expanding the nest site to support 30 - 40 pairs of nesting least terns. This project would not be possible without the partnership of all stake holders.

Significant deviations: none

Activity 2. Train partners by sharing information about the coastal avian guilds and the need to protect their habitat. Trainings will include site visits, a workshop, and presentations. Training

will also include sharing information via web sites, list-serves, and handouts about biological needs of these species.

Workshop at Fort Johnson at the MRD auditorium

This one day workshop was attended by over 100 participants including naturalists from state parks, USFWS, and private lands. The workshop covered conservation and management of seabirds and shorebirds. Presentations included topics such as the conservation status and logistics of protecting beach nesting birds and migratory shorebirds, beach management and engineering, and least terns on rooftops.

Botany Bay Plantation Beach Stewardship

A presentation about shorebird ecology was given to a group of 30 people who volunteer at Botany Bay Plantation, a property that receives high visitor use. A few individuals from this group were selected to be beach stewards during the 2016 nesting season. These stewards were trained in shorebird identification and nesting ecology. Stewards would set up a spotting scope on the beach and use a field guide as a reference while educating visitors about coastal bird conservation. These beach stewards had many opportunities over 3 months to engage with the public and educate them about nesting and migratory shorebirds that utilize Botany Bay Plantation's beaches. Success of this program was not adequately tested in 2017 because the beach was closed due to hurricane damage. We anticipate continuation of the steward program in 2018.

Botany Bay Plantation Educational Sign

Staff worked with Fossil Industries Inc. to create a professional educational sign about shorebirds. This graphic was designed with information about beach nesting birds and emphasized "sharing the beach" with shorebirds. The sign was placed at the entrance to Botany Bay Plantation's beach access (Figure 8).



Figure 8. Educational sign about shorebirds placed at Botany Bay Plantation's beach entrance.

Best Management Practices (BMPs) for Use of Vehicles

We developed a Best Management Practices (BMPs) for Use of Vehicles especially used for Sea Turtle Nest Protection projects. Presentations on seabird and shorebird conservation were given at 4 sea turtle nest protection meetings in 2016 and 2017 that were attended by 100s of volunteers and by staff at beach sites, such as county and state parks, USFWS and private islands. A handout was developed and distributed about BMPs. We worked with sea turtle projects at some locations to delineate areas of the beach to avoid driving because of high

concentrations of nesting birds. See section about CRNWR for examples. See below for BMPs handout developed and distributed primarily to sea turtle management staff and volunteers.

Breeding Birds of the South Carolina Coast Brochure

In Winter 2016/2017, an additional brochure was developed in partnership with the American Bird Conservancy. This brochure featured images of common coastal nesting shorebirds, seabirds, and wading birds. The brochure also had a conservation message about reducing disturbance to these birds. The brochure was distributed Spring 2017. See attachments for the Breeding Birds brochure.

Significant deviations: None.

Summary

This grant provided funding to develop partnerships with many managers of sites that have significant nesting and migratory coastal birds. Part of the focus was in CRNWR, where a majority of some species in South Carolina nest and large concentrations of migratory shorebirds occur. In Spring 2017, CRNWR staff were primarily responsible for monitoring seabird colonies, thus demonstrating a successful partnership that resulted in an increase in the number of staff working toward conservation of shorebirds and seabirds. Enabling CRNWR staff to manage seabird colonies in CRNWR allowed SCDNR staff to develop additional partnerships.

Throughout the state, over 70 people assisted SCDNR coastal bird staff with posting and monitoring nesting areas. Many of these partners continued to manage bird areas Spring 2017 with less involvement and oversight from SCDNR coastal bird staff. Overall, these partnerships were successful and this effort continues to grow.

Estimated Federal Cost: \$32,080.16

Recommendations: Close the grant.

Best Management Practices (BMPs) for Use of Vehicles on Sea Turtle Nesting Beaches in South Carolina

The use of ATVs or similar vehicles in sea turtle management activities such as searching for nests and transporting equipment for nest protection is recognized as an essential requirement for efficient daily coverage of certain sea turtle nesting beaches. However, on these same beaches are nesting seabirds and shorebirds. Their eggs laid in the sand and mobile young can be endangered by the use of these types of vehicles.

The nesting species most commonly encountered are: the colonial nesting least terns and black skimmers, and the solitary nesting shorebirds, American oystercatchers and Wilson's plovers. These species are adapted to reproduce on the beach, and thus have evolved behaviors which enable their young to survive heat and predators. Chicks are mobile and cryptic and use the entire beach from the dunes to the water's edge. Even if a driver has good eyesight and focused driving skills, eggs and young chicks are mostly invisible from the view atop an ATV and other vehicles.

Nesting seabird and shorebird behaviors:

Incubation of eggs is necessary to keep eggs at a constant temperature for a specified period to ensure development of the embryo.

- Eggs are laid above the high tide line. Nests can be very near the high tide line or far from the water's edge behind the dunes.
- Eggs are cryptic to match the surrounding sand and shells.
- Adults leave the nest when disturbed which exposes the eggs to heat, cold, and predation, all of
 which can be lethal. Overheating of eggs is more harmful to embryos than cooling, and mortality
 of exposed eggs can occur in minutes on a hot day. Disturbance distances vary, and adults may
 readily leave when perceived danger is hundreds of feet away.

Adults brood young to warm or shade them as ambient temperatures dictate until young are able to self regulate body temperature.

- Adults brood newly hatched young for 7-12 days after hatching. Prolonged exposure to heat, cold, rain, and wind is lethal to young.
- Young chicks hatch with their eyes open and are able to walk within hours of hatching; they are covered in cryptic down.

Behaviors of young in response to disturbance include:

- Chicks run and hide motionless in vegetation, wrack, debris, and depressions in the sand (i.e. foot prints, tire tracks) or quickly scrape into the sand.
- Sometimes chicks may run and hide 0.5 miles or more from the nest.
- American oystercatcher chicks will readily dive into the water to escape danger and can be lost to strong currents.
- Chicks listen for and respond to alarm calls from adults.



Photo by Abby Sterling

Conservation status:

SPECIES	SWAP (2015)	S.C. LISTED	COMMENTS
Least Tern	Highest Priority	Threatened	Listed as threatened and endangered in most states due to habitat loss
Black Skimmer	Highest Priority	Proposed as threatened	Endangered in N.J.; threatened in N.Y.; special concern in Fla. And N.C.
American Oystercatcher	Highest Priority	Proposed as threatened	Focal species in U.S. Fish and Wildlife Migratory Bird Program
Wilson's Plover	Highest Priority	Threatened	Endangered in Va. and Md.; rare in Ga.; state protected Ala.; focal species in U.S. Fish and Wildlife Migratory Bird Program

BMPs for ATV and similar vehicle use to minimize impacts to seabirds/shorebirds:

- As tidal height permits, drive as low as possible on the beach to allow for sighting turtle crawls above the high tide line. Avoid driving above or on the daily wrack line, especially during the first half of the summer when eggs and very young chicks are in this habitat.
- Vehicle speed should not exceed 10 mph or appropriate speed that allows for observation and avoidance of adults and young.
- Below the wrack line do not drive over objects such as wrack piles, sticks, limbs, grasses, large shells, boards, bottles, cans, and any other object where a chick could be hiding.
- Assign one person to drive the vehicle and focus on avoiding objects and looking ahead for bird
 nests or any young chicks. Another person looks for turtle crawls/nests, and signals to the driver
 when to stop. If surveying a beach alone, the driver must take extra effort to avoid objects, look
 for chicks, and identify sea turtle crawls.
- If possible avoid driving around the ends of islands where bird nesting is typically concentrated, and turtle nesting is typically low. Stop prior to the end and send an experienced individual on foot with binoculars to identify turtle activity: nest or "false crawl." If a nest, determine the least disturbing management. Avoid entering seabird colonies after 9:00 AM.
- Be aware of shorebird nests. If a shorebird nest is found, mark it with a bright colored flag 10 yards before and after the nest site.
- Be aware of incubation periods and hatch dates of shorebird nests to avoid adults and roaming chicks. These species will lay additional clutches of eggs if a previous nest is lost. Thus eggs and young may be present in July.
- Each beach is unique; therefore each island/beach should have its own site-specific plan.

Nesting dates:

SPECIES	NESTING PERIOD	# EGGS	INCUBATION	FLEDGE*
American Oystercatcher	April thru July	2 - 4	25 – 30 days	30 – 35 days
Wilson's Plover	April thru July	2 - 4	25 – 28 days	21 – 25 days
Least Tern	May thru June	1 - 3	19 – 25 days	20 – 22 days
Black Skimmer	May thru July	2 - 4	23 – 25 days	30 – 35 days

^{(*} Fledge is when flight is sustained.)

Compiled by: SCDNR Coastal Birds Project; SCDNR Marine Turtle Conservation Program; Cape Romain National Wildlife Refuge; USFWS Ecological Services; March 2016

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Black-necked Still* L 24,** • Uncommon • Slender shorebird with long reddish-pink legs, black upperparts, white underparts, and long, thin, black bill • Nests on vegetation riverses.

conservation species in SC *
Large, drab, gray-brown shorebird
with long bill and legs – in flight
shows distinctive black and white
wing stripe * Solitary ground
nester a mid marsh or beach
grasses * Forages on beaches and
tidal flars*



Common Tern * L 22" *
Uncommon nesting in SC,
declining * Blood red bill with
black tip, black cap * Nests or
sandy or shelly ground with
other terns or Black Skimmen
Aggressively defends nest







Uncommon nesting in SC, priority conservation species * Mid-steed form with black cap, orange bill with black tip, and orange legs * Nests on the ground in smaller colonies amid marsh and grassec * **









Fun Waterbird Facts

Waterbirds take a wide variety of prey, including fish, crustaceans, snalls, shelfish, worms, amphibians, reptiles, and insects. Roseate Spoonbills are pink because the crustaceans they eat contain pink pigmentation.

- The **Wilson's Plover**, like many plovers, will feign a wing injury if you get too close to its nest. This behavior is called a broken-wing display, and is used to lure predators away from the nest.
- Like owls, many fish-eating birds, such as terns and **Black Skimmers**, regurgitate "pellets" non-digestible parts of their prey such as bones or scales.
- The **American Oystercatcher** has a laterally compressed bill that allows it to easily pry open shellfish to reach its soft-bodied prey inside
- Tems and Black Skimmers display a behavior called "mobbing", flying up as a group to dive-bomb people, dogs, or predators that approach their nesting colonies. Agitated birds will peck at and defecate on intruders, so steer clear of nesting colonies!
- **Black Skimmers** rest in a strange position they lay flat on the ground with their heads stretched out in front of them. "Rest assured" they aren't dead!





Breeding Birds South Carolina Coast

An Angler's and Boater's Bird Guide April - September







Fish, Swim, and Play From 50 Yards Away!

- Why Birds are Important
 Bird abundance is an important indicator of the health of coastal ecosystems
- Revenue generated by hunting, photography, and birdwatching helps support the coastal economy in South Carolina

Threats to Island-Nesting Bay Birds Habitat loss from erosion and wetland degradation Predators such as raccoons, mink, feral hogs, and

- laughing gulls that eat eggs and young Disturbance from humans and their pets Entanglement in discarded or lost fishing tackle
- and other debris





How to Avoid Disturbing Birds

- "Fish, Swim, and Play From 50 Yards Away!"

 Cary I' Norm, the Wools Ambressed or

 Obey posted areas where groups of birds are nesting on islands
- Anchor your vessel at least 50 yards away from nesting islands and beaches Keep children and pets away from closed nesting
- Move away from nesting birds if they increase vocalization, fly off their nests, or otherwise move away from you Do not leave discarded fishing tackle behind —
- dispose of it properly on the mainland
 If you see someone destroying nests or disturbing

a nesting colony of birds, please contact: South Carolina Department of Natural Resources at 1-800-922-5431



Breeding Birds of the South Carolina Coast





moderate conservation concern * Largest heron – overall gray-blue with yellowish bill – will extend and coil long neck * Nests colonially in mature



Snowy Egret * L. 24" * Common, specie of conservation concern * Small, white egret with long black bill; yellow feet contrast with dark legs; yellow skin around eye * Nests in mixed-species











Roseate Spoonbill * L 32" * Uncommon SC conservation species * Unmistakable pale pink wading bird with a long bill anding in lift "spoon" * Does not nest in 5K, but visit in summer and fall * Wades slowly throug water, sweeping touch sensitive bill side to side in search of prey



Wood Stork * Luo* * Fedrally
threatened species and SC endangere
* Bald head, large with black trailing
edge of wings * Nests with other woos
storks high in trees over varier * Feeds
by feeling for prey with its bill in the

Anhinga * 1.35" * Priority conservation species in South Carolina * Black diving bird with a long straight bill and snakelik neck * Nests in mixed species groups in trees and shrubs in brackish or freshwate areas * Spears fish with its bill









American Oystercatcher • L 17" • SC American Oystercatcher * L 37" * 5C. high priority conservation species * Black and brown with white underside; large, laterally flattened, reddish-orange bill and red eye ring * Solitary nester on slightly vegetated sandy berms and shell rales * Forages on tidal flats for oysters and other shellfish

